

Abnormal Surfaces

- *Vascular injury*
- *Heart valve disease*
- *Heart valve replacement*
- *Acute myocardial infarction*
- *Indwelling venous catheters*

Patients in cardiovascular surgery service or cardiology make up the largest portion of patients with surface abnormalities.

表面の異常

○血管障害

○心臓の弁の病気

○心臓の弁の置換

○急性心筋梗塞

○静脈カテーテル

Abnormal Clotting Components

- *Malignancy*
- *Estrogen therapy*
- *Pregnancy*
- *Antithrombin III deficiency*
- *Antiphospholipid antibody syndrome*
- *Protein C or Protein S deficiency*

Patients with abnormal clotting components also can come from an array of services, including oncology, geriatrics, gynecology, and hematology.

凝固因子の異常

- 悪性腫瘍
- エストロゲンの補充
- 妊娠
- 抗トロンビンⅢ欠損
- 抗リン脂質抗体症候群
- プロテインCまたはプロテインSの欠損

What Support is Needed to Start a Service?

- *Physicians*
 - *cardiovascular surgeons*
 - *cardiologists*
 - *internists*
- *Administration*
 - *legal*
 - *financial*
 - *costs versus revenue versus avoidance*
- *Payers*
- *Your own professional peers*

If your clinic or medical center is considering the implementation of an anticoagulant service, utilizing pharmacists, there are a few key areas of support we would recommend.

First, be sure you are working from the beginning with physicians, and most likely the physicians on the slide. These are the services the majority of patients will be referred from.

Clinic or hospital administration will be interested in how the service will be designed to minimize legal risks, and what impact this service will have on institution costs, and institution revenue. Maybe your institution want to begin this service as a way to avoid extra costs of other patient problems such as strokes, myocardial infarction, and other medical morbidity.

Insurance companies and managed care organizations are interested in reducing their costs of care. Educate them about the advantages these services have for them.

You will also want your professional peers to support your activity.

サービスを開始するために何が必要か？

医師

心臓血管外科医

心臓専門医

内科医

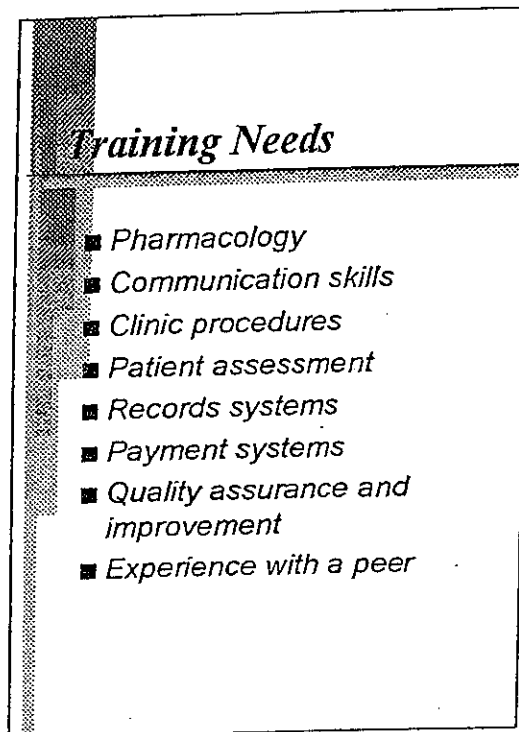
管理

法律

財務

— 費用 vs 収益 vs 逃避

患者



What do the pharmacists need to know before beginning the service?
There is quite a bit to know, but fortunately, pharmacists know a number of these things. Let's look at each one of these topics separately.

訓練の必要性

- 薬理学
- コミュニケーション技能
- 臨床上的の方法
- 患者の評価
- 記録システム
- 支払いシステム
- 質の評価と改良
- 同僚との経験

Pharmacology - Medications

■ Warfarin

- *MOA - Inhibits clotting factors produced by vitamin K*
- *Slow onset*
- *Antidote - vitamin K*
- *Monitored - International normalized ratio (INR) or prothrombin time ratio (PT)*

First is the pharmacology of the medications.

The pharmacist must be aware of the basic and subtle properties of warfarin. It is important to know its activity, what to do in an urgent situation, and how to educate the patient who is taking the medication.

In addition, the pharmacist must know how to monitor the patient on warfarin, what standards are used in the laboratory, and how to convert from one monitoring system to another.

薬理学—薬物

○ワルファリン

MOA—ビタミンKにより産生される
凝固因子を阻害する。

遅効性

解毒剤—ビタミンK

モニタリング—INRまたはPT

Pharmacology - Medications

■ Warfarin

- *Uses - reducing red clot incidence*
 - *intracardiac thrombi*
 - *thromboembolism (DVT or PE)*
 - *pooling of blood and factors in the heart*
- *Dose varies*
 - *age, diet, diagnosis, other medications, genetic factors*
 - *usually 5 to 7.5 mg, but from 1 to 15 mg daily*

Warfarin is not used the same for all cardiovascular problems.

The dose of warfarin can and should vary in patients. Even though the most common doses are from 5 to 7.5 mg each day, doses may range widely.

薬理学—薬物

○ワルファリン

使用—血液凝固を抑制する。

—心臓内血栓

—血栓塞栓症 (DVT, PE)

—心臓における血液と因子の貯留

用量は一様でない

—年齢、食事、診断、その他の薬剤、遺伝因子

—通常、5-7 mg/day、1-15 mg/dayの範囲

Pharmacology - Medications

- *Low Molecular Weight Heparin*
 - *MOA -*
 - *Rapid onset*
 - *Antidote - protamine sulfate*
 - *Monitored - simple*

More often, we are asked to monitor the patient on low molecular weight heparin instead of warfarin. The most likely population for this therapy are patients diagnosed in the emergency department with deep vein thrombosis. They are discharged home and started on enoxaparin instead of being started on heparin and transitioned to warfarin.

Except for the challenges of teaching patients how to use the injectable low molecular weight heparin, the treatment plan can be much simpler with enoxaparin.

薬理学—薬物

○低分子量ヘパリン

MOA—

即効性

解毒剤—protamine sulfate

監視—単純

Pharmacology - Medications

■ *Low Molecular Weight Heparin*

- *treatment of established clots*
- *prevention of deep venous thrombosis*
- *Dose varies*
 - *low dose prophylaxis 30 mg subcutaneously every 12 hours (enoxaparin)*
 - *high dose 1mg/kg every 12 hours (enoxaparin)*

Low molecular weight heparin is used for treatment of established clots and prevention of deep venous thrombosis.

The dose varies.

Low and high dose regimens are used. Low for prophylaxis after hip or knee replacement surgery, and and high dose for treatment for angina and some types of myocardial infarction.

薬理学—薬物

○低分子量ヘパリン

慢性凝塊に対する治療

深部静脈の血栓症の予防

用量は一様でない

—低用量予防的 30 mg 12時間毎皮下
(enoxaparin)

—高用量 1 mg/kg 12時間毎
(enoxaparin)

Pharmacology - Medications

- *Aspirin*
- *Ticlopidine*
- *Clopidrogel*

Some other medications are used for treatment or prophylaxis, but are not typically part of the anticoagulant service monitoring.

薬理学—薬物

- Aspirin
- Ticlopidine
- Clopidrogel

Pharmacology - Common Complications

- *Diet*
- *Other medications*
- *Alcohol*
- *Bleeding or clotting*

The pharmacist is trained to understand the effect that diet, other medication, alcohol and other bleeding or clotting disorders can have on the patient on warfarin or enoxapirin.

薬理学—一般的合併症

- 規定食
- その他の薬剤
- アルコール
- 出血または凝塊

Pharmacology - Drug Interactions

Drugs Increasing or Decreasing Warfarin Effects

- *Increasing or decreasing warfarin metabolism*
- *Decreasing warfarin absorption*
- *Displacing warfarin from binding sites in plasma*
- *Alteration of clotting factors*

Drug interactions are an important part of the monitoring of anticoagulant patients. Other drugs can effect the metabolism, absorption, or binding of warfarin, or effect clotting factor activity.

薬理学—薬物相互作用

ワルファリンの効果を増強または減弱する薬物

- 代謝を促進または抑制する
- 吸収を抑制する
- 血中蛋白結合部位で競合する
- 凝固因子に影響する

<i>Pharmacology - Drug Interactions</i>	
<i>Drugs Increasing Warfarin Effects</i>	
■ Amiodarone	■ Fenofibrate
■ Acetaminophen?	■ Fluconazole
■ Aspirin	■ Fluoxetine
■ Cimetidine	■ Fluvoxamine
■ Ciprofloxacin	■ Itraconazole
■ Clarithromycin	■ Ketoconazole
■ Clofibrate	■ Metronidazole
■ Cotrimoxazole	■ NSAIDS?
■ Erythromycin	■ Norfloxacin
	■ Vitamin E

Here is a list of the most commonly known drugs known to increase the effects of warfarin. These include a number of antibiotics, antifungals, and a selection of other agents. Some medications appear to have an effect of increasing warfarin's effects, but results are mixed, such as acetaminophen and non-steroidal anti-inflammatory agents (NSAIDS).

薬理学—薬物相互作用

ワルファリンの効果を増強する薬物

Amiodarone	Fenofibrate
Acetaminophen?	Fluconazole
Aspirin	Fluoxetine
Cimetidine	Fluvoxamine
Ciprofloxacin	Itraconazole
Clarithromycin	Ketoconazole
Clofibrate	Metronidazole
Cotrimoxazole	NSAIDS?
Erythromycin	Norfloxacin
Vitamin E	

Pharmacology - Drug Interactions

Drugs Decreasing Warfarin Effect

- *Barbiturates*
- *Carbamazepine*
- *Cholestyramine*
- *Griseofulvin*
- *Nafcillin*
- *Rifampin*
- *Vitamin K*

On this list you will see several of the medications known to decrease the effect of warfarin.

Note that on this list and the previous list, there are a number of medications that are commonly used, and that may be given together. The pharmacist is skilled to monitor the changes in the patient and adjust dosing or to negotiate changes as needed.

薬理学—薬物相互作用

ワルファリンの効果を減弱する薬物

Barbiturates

Carbamazepine

Cholestyramine

Griseofulvin

Nafcillin

Rifampin

Vitamin K

Pharmacology - Other Cautions

- *Warfarin contraindicated in:*
 - *pregnancy*
 - *active bleeding situation*
 - *allergy*
 - *non compliance*
 - *psychiatric patients unable to dose or unreliable*

Patient and practitioner education should also include the contraindications to warfarin, including pregnancy, bleeding, allergy, compliance problems and psychiatric disturbances which may coexist.

薬理学—その他の注意点

ワルファリンは次の場合には禁忌である。

妊娠

出血時

アレルギー

ノンコンプライアンス

服用できなかつたり信頼できない精神科の患者

Pharmacology - Monitoring

■ Warfarin

- *INR range is typically 2.0 to 3.0*
- *Exception - mechanical valves at 2.5 to 3.5*
- *Exception - patients with recurrent thromboembolic disease, raise to 2.5 to 3.5*
- *INR two or three times weekly for 2 weeks*
- *Weekly if stable*
- *4 weeks at most*

The INR range goal for most patients is 2.0 to 3.0.

Exceptions are patients with mechanical heart valves and patients with recurrent thromboembolic disease. In these cases, the INR is maintained at a slightly higher range of 2.5 to 3.5.

INR evaluations are performed frequently at first and at intervals of a month at most.

薬理学—モニタリング

○ワルファリン

INRの目標範囲は2.0-3.0

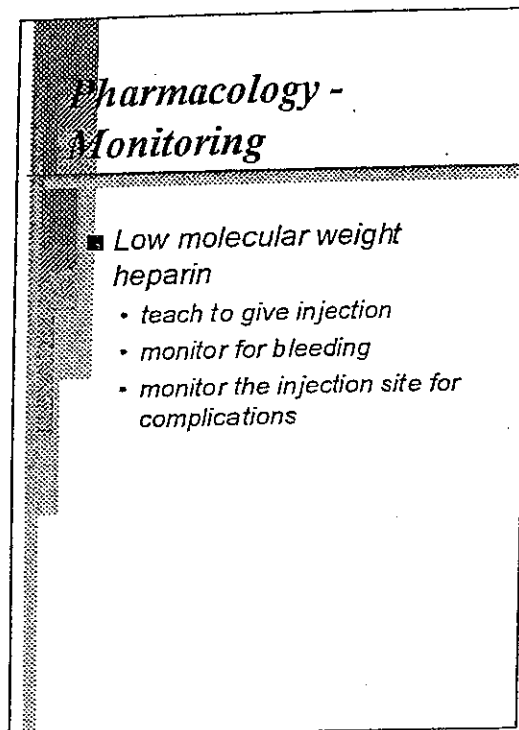
例外—人工弁の患者 2.5-3.5

例外—再発血栓塞栓症 2.5-3.5

INRの測定は初めの2週間は週に2-3回行う

安定であれば週に1度

多くて4週間



The use of low molecular weight heparin is much simpler.

Essentially, once the patient is taught to inject themselves safely, and taught to monitor tendencies or incidents of bleeding, there is no other monitoring to do.

Patients on low molecular weight heparin certainly should be seen but not as intently.

Low molecular weight heparin is approved only for the following:

Hip and knee replacement surgery.

Abdominal surgery who are at risk for thromboembolic complications, such as obese, surgery over 30 minutes under general anesthesia, or who have additional risks such as malignancy or history of deep vein thrombosis or pulmonary embolism.

Prevention of ischemic complications of unstable angina and non Q wave myocardial infarction when given with aspirin.

薬理学—モニタリング

○低分子量ヘパリン

注射の指導

出血の監視

合併症に注意して注射部位を監視

Communication Skills

- *Remain goal oriented*
- *Establish trust and honor in person or on the telephone*
- *Express authority*
- *Practice empathy*
- *Establish relationships*

Pharmacists (and pharmacy students I have worked with) need to develop their communication skills if they are going to work in an anticoagulation clinic.

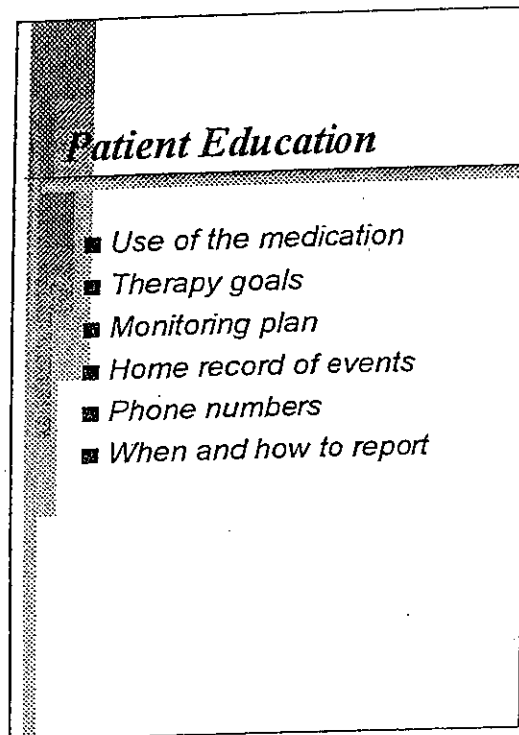
Pharmacists, like other health practitioners, must remain goal oriented. It is important to continue to work toward assuring the patient can function safely and effectively. Some practitioners do not function well in the clinic at first because they do not organize their time and actions toward their goal. Consequently, time is wasted.

Otherwise, many successes that pharmacists have had have come from offering the patient adequate time and patience. The pharmacist must realize the power and importance in treating the patient with honor, building trust with the patient, and being empathetic yet assertive with the patient.

These are characteristics that are not "natural" for all pharmacists. They are largely learned skills.

コミュニケーション技能

- 常に目標に向かう
- 直接または電話で信頼と尊敬を確立する
- 権威を表わす
- 感情移入を実施する
- 関係を構築する



Patients must learn their role in anticoagulation treatment.

Practitioners will find it important to use several teaching techniques to help adults learn.

Written information, visuals, videotapes, demonstrations, and role playing are all potentially helpful.

In addition, patients must learn the goals in therapy, how to keep a home record, and how to contact the practitioner if an urgency occurs.

患者教育

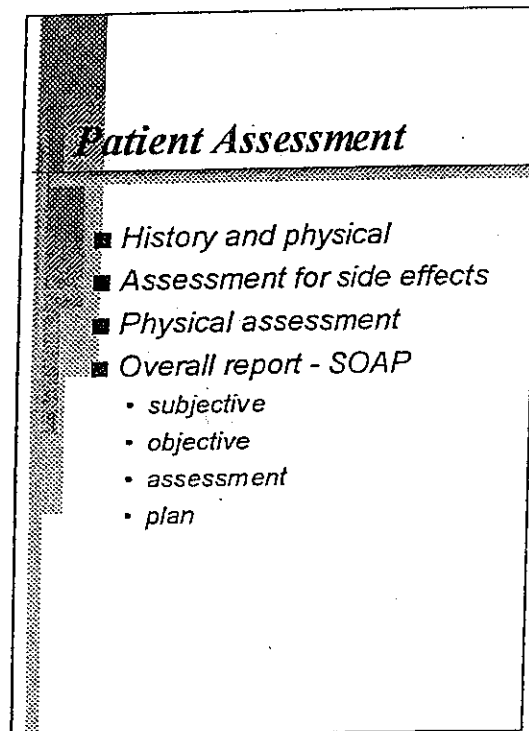
○薬剤の使用

○治療目標

○家庭での記録

○電話番号

○報告の時間と方法



Pharmacists participating in an anticoagulant clinic should be well trained to take a brief history, to be able to ask pertinent questions of the patient, and to perform needed physical assessment to determine the patient's status.

A report of the encounter with the patient can be done many ways. One common method used in America is the S.O.A.P. plan. The letters stand for subjective, objective, assessment and plan.

The way I teach students about the SOAP method, is that subjective information is largely what the patient tells you is going on, the objective information is what you measure or see. The assessment is your opinion of what is going on. The plan is "what you are going to do about it"!

This method of recording gives the pharmacist structure and consistency.

At this time, there are very few standards of practice for record keeping.

患者の評価

○病歴と身体評価

○副作用の評価

○身体的評価

○全体的報告—SOAP

主観的

客観的

評価

計画

Procedures - Policy

- *Referrals*
- *Types of patients*
- *Agreements with physicians*
- *Agreements with payers*
- *Financial*
- *Laboratory standards*

Any clinic or facility needs to have written policy and procedures for the activities taking place.

The anticoagulant clinic is no exception.

Various regulatory bodies in the clinic, hospital, or outside agency will dictate standards.

方法一方針

照会者

患者の種類

医師との同意

支払い人との同意

財務

検査標準